

### **Claims**

I claim:

1. A fire suppression system for detecting and suppressing fires in a protected space, comprising:

(a) a plurality of reservoirs, each said reservoir containing a fire retardant;

(b) a piping network, selectably providing fluid communication between said plurality of reservoirs, and to a plurality of sprinklers, each said sprinkler being associated with a predetermined localized portion of the protected space;

(c) at least one valve;

(d) at least one fire detector, said at least one fire detector associated with a predetermined localized portion of said protected space.

2. The fire suppression system recited in claim 1, wherein said at least one valve may be closed to selectively isolate segments of said piping network.

3. The fire suppression system recited in claim 1, wherein said at least one of valve may be opened to form a path through said piping network for said fire retardant to be selectably shared among said plurality of retardant reservoirs.

4. The fire suppression system recited in claim 1, wherein said piping network comprises at least two flow paths.

5. The fire suppression system recited in claim 1, and further comprising a control station, said control station being operative to control at least one of said at least one valve.

6. The fire suppression system recited in claim 1, and further comprising a control station, said control station comprising system status monitor displays.

7. The fire suppression system recited in claim 1, and further comprising a plurality of control stations, said plurality of control stations being redundantly disposed, and said control stations comprising system status monitor displays, and said control stations being operative to close and open said at least one valve.

8. The fire suppression system recited in claim 1, wherein said piping network comprises at least one first flow path and at least one second flow path, said at least one first flow path being spatially separated from said at least one second flow path.

9. The fire suppression system recited in claim 1, wherein said fire retardant is water.

10. The fire suppression system recited in claim 1, wherein said fire retardant is pressurized.

11. The fire suppression system recited in claim 1, wherein said fire retardant comprises at least one of: a dry chemical, a foam, an inert gas, a powdered aerosol, or a halon.

12. The fire suppression system recited in claim 1, wherein said at least one fire detector comprises at least one of: a smoke detector; a carbon dioxide detector; a thermal sensor; a spectrometer; a chromatograph; a flame-reactive device; a humidity sensor; or a camera.

13. The fire suppression system recited in claim 1, wherein said at least one fire detector further comprises a sensor data profile evaluator.

14. The fire suppression system recited in claim 1, wherein a plurality of said at least one fire detector are disposed throughout the protected space and interconnected in an imbricate topology.

15. The fire suppression system recited in claim 1, wherein said at least one valve comprises at least one of: a manually operable valve; an electrically operable valve; or a hydraulically operable valve.

16. The fire suppression system recited in claim 1, and further comprising a means for audible annunciation.

17. A fire suppression system for detecting and suppressing fires in a protected space, comprising:

- (a) a plurality of reservoirs, each said reservoir containing a fire retardant, and each said reservoir having a retardant level sensor;

- (b) a piping network, selectably providing fluid communication between said plurality of reservoirs, and to a plurality of

sprinklers, each said sprinkler being associated with a predetermined localized portion of the protected space;

(c) at least one valve;

(d) at least one damage sensor;

(e) at least one fire detector, said fire detector being associated with a predetermined localized portion of the protected space;

and

(f) a signaling means, communicating data between said at least one damage sensor, said at least one fire detector, said retardant level sensors, and said at least one valve.

18. The fire suppression system recited in claim 17, wherein said at least one fire detector activates at least one of said plurality of sprinklers when said at least one fire detector detects a fire.

19. The fire suppression system recited in claim 17, wherein said at least one damage sensor closes at least one of said at least one valve, to isolate segments of said piping network.

20. The fire suppression system recited in claim 17, wherein said at least one fire detector is operative to open at least one of said at least one valve, to form a path through said piping network for said fire retardant to be shared among said plurality of retardant reservoirs.

22. The fire suppression system recited in claim 17, wherein said retardant level sensors are operative to open at least one of said at least one valve, to form a path through said piping

network for said fire retardant to be shared among said plurality of retardant reservoirs.

22. The fire suppression system recited in claim 17, wherein said piping network comprises at least two flow paths.

23. The fire suppression system recited in claim 17, and further comprising a control station, said control station being operative to override automatic closing and opening of said at least one valve.

24. The fire suppression system recited in claim 17, and further comprising a control station, said control station comprising system status monitor displays.

25. The fire suppression system recited in claim 17, and further comprising a plurality of control stations, said plurality of control stations being redundantly disposed, and said control stations comprising system status monitor displays, and said plurality of control stations being operative to override automatic closing and opening of said at least one valve.

26. The fire suppression system recited in claim 17, wherein said piping network comprises at least one first flow path and at least one second flow path, said at least one first flow path being spatially separated from said at least one second flow path.

27. The fire suppression system recited in claim 17, wherein said fire retardant is water.

28. The fire suppression system recited in claim 17, wherein said fire retardant is pressurized.

29. The fire suppression system recited in claim 17, wherein said fire retardant comprises at least one of: a dry chemical; a foam; an inert gas; a powdered aerosol; or a halon.

30. The fire suppression system recited in claim 17, wherein said at least one fire detector comprises at least one of: a smoke detector; a carbon dioxide detector; a thermal sensor; a spectrometer; a chromatograph; a flame-reactive device; a humidity sensor; or a camera.

31. The fire suppression system recited in claim 1, wherein said at least one fire detector further comprises a sensor data profile evaluator.

32. The fire suppression system recited in claim 17, wherein said signaling means comprises a data signaling network.

33. The fire suppression system recited in claim 17, wherein said signaling means comprises at least one of: an electrical wire; an optical transceiver; a radio transceiver; hydraulics; gears; linkages; bi-level voltages; analog voltages; multiplexing; or data packetization.

34. The fire suppression system recited in claim 17, wherein said at least one damage sensor comprises an electrical continuity wire, said electrical continuity wire being run proximate to said piping network.

35. The fire suppression system recited in claim 17, wherein said at least one damage sensor comprises at least one of: a flow sensor; a pressure sensor; a temperature sensor; an electrical sensor; a camera; or a moisture sensor.

36. The fire suppression system recited in claim 17, wherein said retardant level sensor comprises at least one of: a mechanical float; a pressure sensor; a moisture sensor; or an optical sensor.

37. The fire suppression system recited in claim 17, wherein said at least one fire detector and said retardant level sensors are disposed throughout the protected space and interconnected in an imbricate topology.

38. The fire suppression system recited in claim 17, wherein said at least one valve comprises at least one of: an electrically operable valve; a hydraulically operable valve; or a mechanically operable valve.

39. The fire suppression system recited in claim 17, and further comprising a means for audible annunciation.